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PLATYPROTUS PHYLLOSOMA, GEN. NOV., SP. NOV., FROM ENDERBY LAND, ANTARCTICA, AN UNUSUAL MUNNOPSIDID WITHOUT NATATORY PEREOPODS (CRUSTACEA: ISOPODA: ASELLOTA)

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Abstract

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A new genus and species, *Platyprotus phyllosoma*, of munnopsidid isopod is described from Enderby Land, Antarctica. *Platyprotus* differs from all other munnopsidids, except *Microprotus* Richardson, 1910 and some species in *Storthyngurella* Malyutina, 1999, in having fully ambulatory pereopods 5–7 without natatory setae. *Platyprotus* differs from those genera primarily in body shape, lack of marginal spines on pereonites 5–7 and pleotelson, lack of a preanal ridge, and in possessing highly derived spatulate setae on article 3 of the mandibular palp. All three genera are part of the wider '*Storthyngura*' clade. If the present concept of *Storthyngurella* is confirmed, ambulatory pereopods 5–7 have been derived independently more than once within that clade. The family name is emended to Munnopsididae Hansen, 1916.

Introduction

The Munnopsididae are a highly diverse family occurring in all oceans primarily in deep water from upper slope to hadal depths, as well as at shelf depths in polar and subpolar regions. The natatory pereopods 5–7 with expanded, flattened carpi and propodi fringed with long plumose natatory setae generally have been considered the most immediately recognisable synapomorphy in the Munnopsididae (Wilson, 1989).

Wilson et al. (1989) transferred *Microprotus* Richardson, 1910 from the Janiridae to the Munnopsididae. The five known species in *Microprotus* have ambulatory pereopods 5–7 with tubular carpi and propodi without plumose natatory setae. Wilson (1989) recognised seven subfamilies in the Munnopsididae, but left several genera, including *Microprotus* and *Storthyngura* Vanhöffen, 1914 as incertae sedis. Wilson et al. (1989) considered *Microprotus* to be most closely related to the heterogeneous *Storthyngura* complex.

Malyutina (1999) described a new genus, *Storthyngurella*, with eight species from abyssal to upper hadal depth, five of which were transferred from the *Storthyngura complex*. Two of the species referred to *Storthyngurella*, *S. menzies* Malyutina and *S. triplispinosa* Menzies, have ambulatory pereopods 5–7. The remaining species, including the type species of *Storthyngurella, S. hirsuta* Malyutina, 1999, have slender natatory pereopods 5–7 with short plumose setae along the posterior margin of carpus and propodus.

This paper reports on a new munnopsidid species from Antarctica, *Platyprotus phyllosoma* gen. nov. and sp. nov., with ambulatory pereopods 5–7 and no natatory setae. *Platyprotus* shares with *Storthyngura* and *Microprotus* a suite of characters listed by Wilson (1989: 343) as strong indicators of a monophyletic taxon. Malyutina (1999: 269) added *Storthyngurella* to this clade. *Platyprotus* differs from the other three genera mentioned, notably in body shape, in the lack of body spines along the margins of pereonites 5–7 and the pleotelson, in the complete lack of a preanal ridge on the pleotelson, and in the uniquely spatulate setae on article 3 of the mandibular palp (Table 1). These differences are considered autapomorphic.

Wilson et al. (1989) concluded that the ambulatory pereopods 5–7 of *Microprotus* are an apomorphic reversal within the Munnopsididae, derived from the natatory pereopods of an ancestral *Storthyngura*. The presence of a group of species with ambulatory pereopods within *Storthyngurella*, and the discovery of *Platyprotus*, do not disprove this hypothesis. The question arises, however, as to whether this reversal combines *Microprotus*, *Storthyngurella* and *Platyprotus* in a monophyletic taxon. For that hypothesis to be accepted *S. menzies* and *S. triplispinosa* would have to be, a priori, recognised as a separate

Table 1. Characters of presumed generic significance among *Microprotus*, *Storthyngurella* (characters in bold refer to species without natatory pereopods), *Storthyngura* and *Platyprotus* gen. nov.

Character	*Microprotus*	*Storthyngurella*	*Storthyngura*	*Platyprotus*
Body shape	subcylindrical	subcylindrical	subcylindrical	flat
Dorsal spines on cephalon	absent	present	present/absent	absent
Lateral spines on pereonites number	2–7	4–7	1/3/4–7	3–4
Lateral spines on pleotelson	present	present	present (absent*)	absent
Apical spines on pleotelson	2	1	variable/absent	absent
Pleotelson articulation	fused	**free**/fused	fused/free	free
Preanal ridge	present	present	present	absent
Medial spine on article 1 of antenna 1	absent	present	present/absent	present
Mandibular palp article 3 setae	simple	simple	simple	complex, spatulate
Maxilliped epipod lateral tooth	present	present **or absent**	present or absent	absent
Male pleopod 2, apex of basis	acute	rounded	acute	rounded
Male/female pleopod 2 setae	simple	?	variable: no setae to short plumose	long hemiplumose
Pleopod 3, endopod setae	numerous	**3**–4	3-numerous	3

*Two of the many *Storthyngura* species, *S. eltaniae* Georges and Menzies, 1968 and *S. torbeni* George, 1987 lack pleotelson spines; both have a simple pleotelson of *Eurycope*-like shape.

(new) genus, since the remaining species in *Storthyngurella* have slender natatory pereopods 5–7. The alternative is to accept that ambulatory pereopods 5–7 were derived more than once as part of an evolutionary trend within the '*Storthyngura*' clade. This is the only possible hypothesis if the present concept of *Storthyngurella* is confirmed. Table 1 does not provide answers to these questions, which can only be addressed by a full cladistic analysis of the entire '*Storthyngura*' clade.

Munnopsididae Hansen, 1916, nom. emend.

Remarks. Most prior authors have referred to this family as Munnopsidae (or erroneously as Eurycopidae). G.D.F. Wilson (pers. comm.) has drawn my attention to the fact that the genitive of the latinised adjectival ending *-opsis* (Greek, like) of *Munnopsis* is *-opsidis* and the family name is here emended to Munnopsididae.

Platyprotus gen. nov.

Type species. Platyprotus phyllosoma sp. nov.

Diagnosis. Munnopsididae with pereopods 5–7 ambulatory, without natatory setae. Body flattened, widening from pereonite 1 to pleotelson. Pleotelson free. Middorsal spines short, triangular. Lateral spines (not coxal spines) on pereonites 3 and 4 only. Pleotelson without marginal spines. Pleotelson without preanal ridge. Antenna 1 article 1 with strong medial spine. Antenna 1 flagellum with aesthetases on distal-most half of articles. Mandible with posterior projection articulating with cephalon in short notch. Mandibular palp article 3 with highly modified spatulate setae. Mandibular incisor teeth distinct. Maxilliped epipod lateral margin smooth. Male pleopod 2 protopod with broadly rounded apex, fringed with long hemiplumose setae. Pleopod 3 endopod with 3, exopod with 9 pappose setae.

Etymology. The name combines references to the flat body and to the similarity of pereopods 5–7 to *Microprotus*.

Platyprotus phyllosoma sp. nov.

Figures 1–8

Material examined. Holotype. Off Enderby Land, Antarctica (65°50.1′S, 50°34.30′E–65°50.10′S, 50°34.90′E), 540 m–2°C, mainly rocky bottom with mud/clay patches, dominant biota: crustaceans, ophiuroids, bryozoans, hard coral, 20 Nov 1985, M. Norman on *Nella Dan*, WHOI epibenthic sled (stn. IIRD-011). Museum Victoria, J47017 (male, 5 mm, with 5 slides — pleopod 1 missing, presumably lost during collecting).

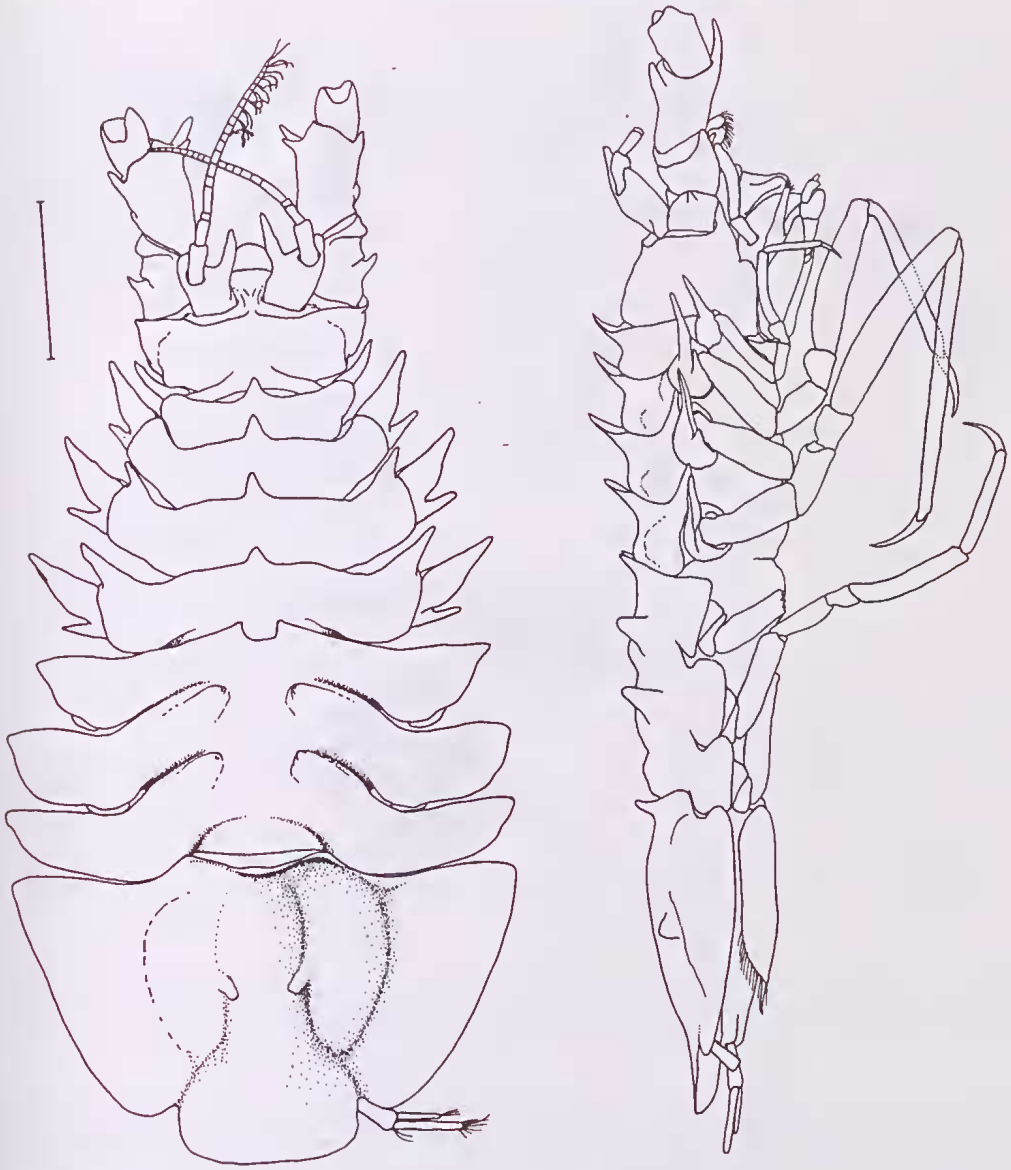

Figure 1. *Platyprotus phyllosoma* sp. nov., holotype. Scalebar: 1 mm.

Paratype. Same data as holotype, Museum Victoria, J47135 (female, 4.1 mm).

Description (holotype, male). Body broad, flattened; width increasing from pereonite 1 to 7, pereonite 7 about 2.3 times wider than 1.

Cephalon without rostrum, 2.5 times wider than long, 20% wider than pereonite 1; with strong frontal ridge, epistome broadly rounded in lateral view.

Pereon: Pereonites 1–4 with 1 short, dorsal, triangular, forward pointing spine on midanterior margin; pereonite 1 with single long coxal spine; pereonite 2–4 with bifurcate broad coxal spine, anterior part more than twice length and width of

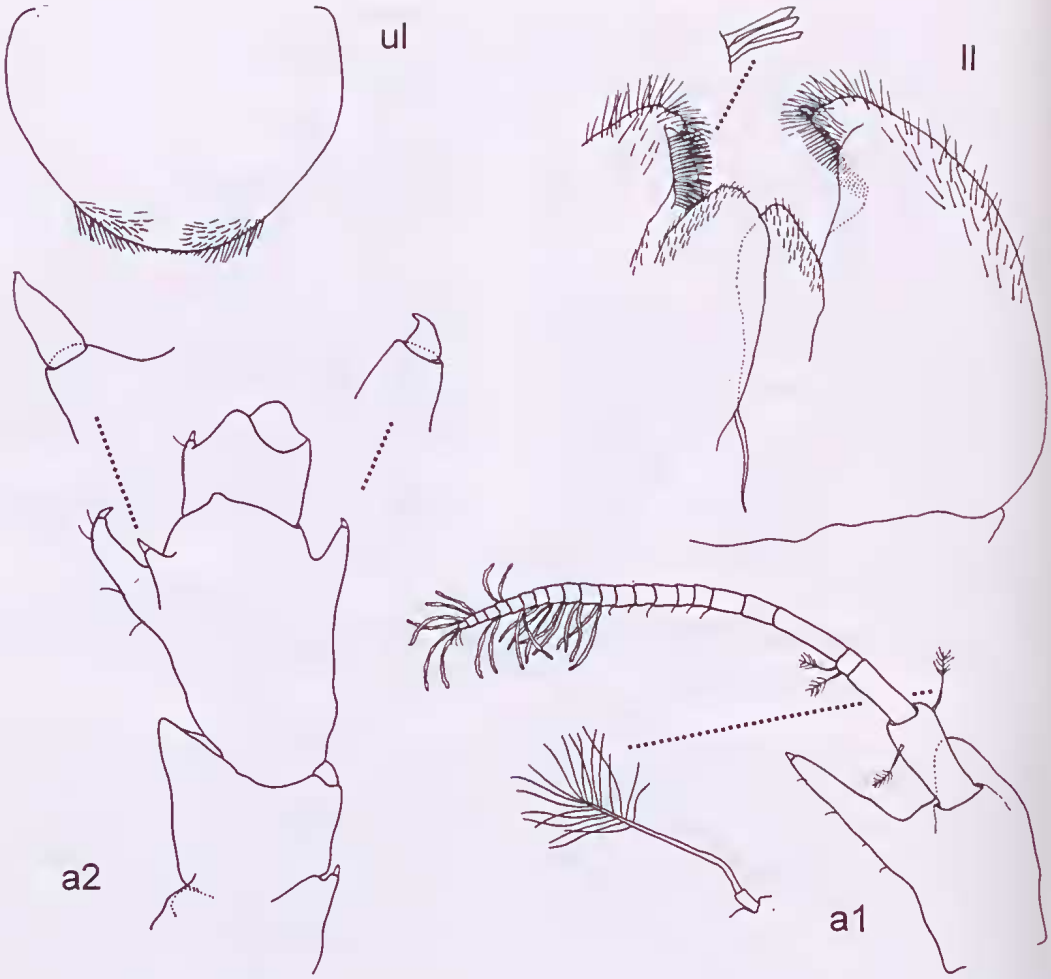

Figure 2. *Platyprotus phyllosoma* sp. nov., holotype, except ul: paratype female. a1, antenna 1; a2, peduncle of antenna 2; ll, lower lip.

posterior part; pereonites 3 and 4 with single anterolateral spine. Pereonite 1 about 75% length of 2, pereonites 2–4 of equal length; pereonites 5–7 fused, 5 with midanterior sinus flanked by 2 short, pointed spines, 6 and 7 with 2 broad, apically rounded spines near anterior margin at point of pereonite fusion, lateral margins widely over-reaching coxae, without spines. Pereonites 1–4 combined about same length as 5–7 combined.

Pleotelson free, straight and ventrally flat in lateral view, as long as pereonites 4–7 combined; as wide at base as pereonite 7, semicircular, except for triangular notches at insertion of uropods, length 60% greatest width; without preanal ridge; without lateral or apical spines; anterior dorsal margin with raised transverse keel in area of articulation with pereonite 7; dorsal surface with broad, rounded midlongitudinal ridge and rounded inflations on each side, 2 short rounded spines at midlength between middle ridge and lateral inflations; anus external to respiratory chamber, not covered by pleopods.

Antennae: Antenna 1 as long as pereonites 1–4 and half of 5 combined; article 1 with rounded projection anterolaterally and long, slender spine medially, article 2 inserted dorsally on 1, article 3 slightly shorter than 2, 4 quarter length of 3, 5 subequal to 3, with an additional 19 short articles, distal ones with aesthetases. Antenna 2 article 1

Figure 3. *Platyprotus phyllosoma* sp. nov., holotype. Mandibles: r, right; l, left.

with small distolateral spine, article 2 without spines, article 3 with 1 short and 1 long distomedial spines and 1 distolateral spine, all spines tipped by short broad seta; (flagellum not known).

Mouthparts: Upper lip evenly rounded, with 2 fields of distal setae.

Mandible with elongate cuticular projection articulating with cephalon in shallow groove (Fig. 7c); left mandible with broad, right with more narrow incisor of 3 rounded (presumably worn) teeth, left with broad, irregular lacinia mobilis with 4 rounded teeth and row of more than 10 slender setae, right with similar number but broader, microdentate setae; molar cylindrical, hollowed truncate, with short row of microdentate setae on posterior margin; palp exceeding length

Figure 4. *Platyprotus phyllosoma* sp. nov., holotype. mp, maxilliped; m1, m2, maxillae 1, 2.

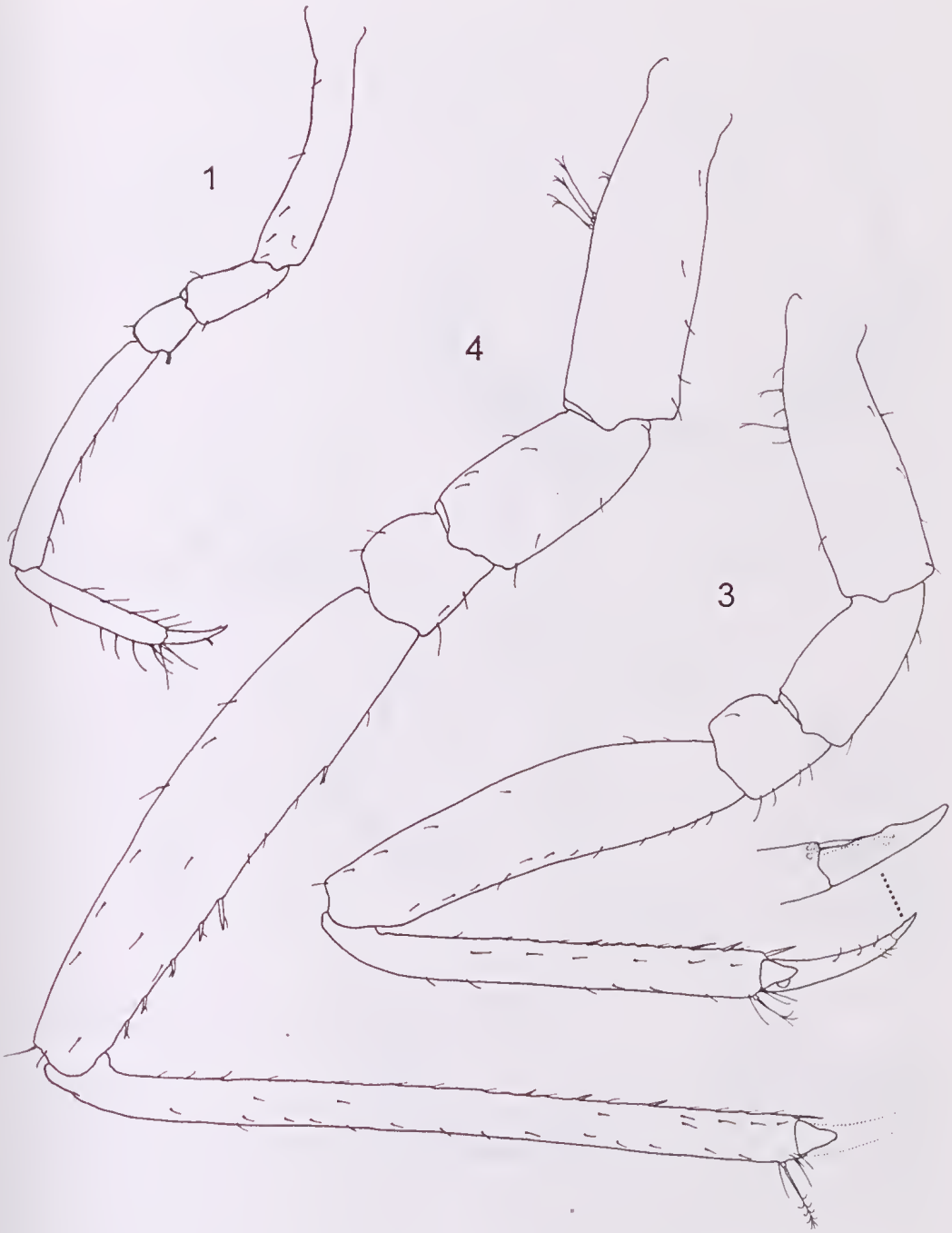

Figure 5. *Platyprotus phyllosoma* sp. nov., holotype. Pereopods 1, 3 and 4.

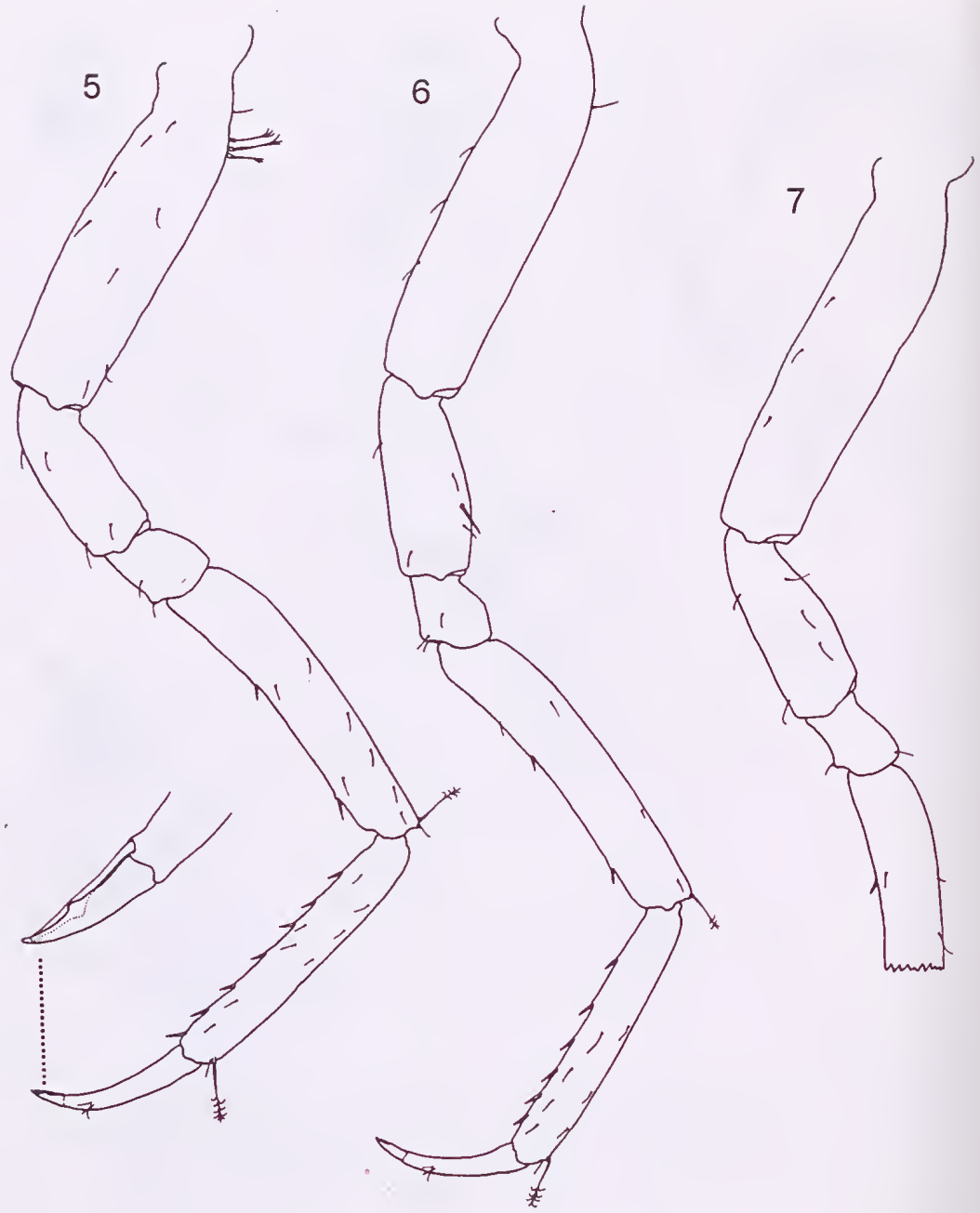

Figure 6. *Platyprotus phyllosoma* sp. nov., holotype. Pereopods 5, 6 and 7.

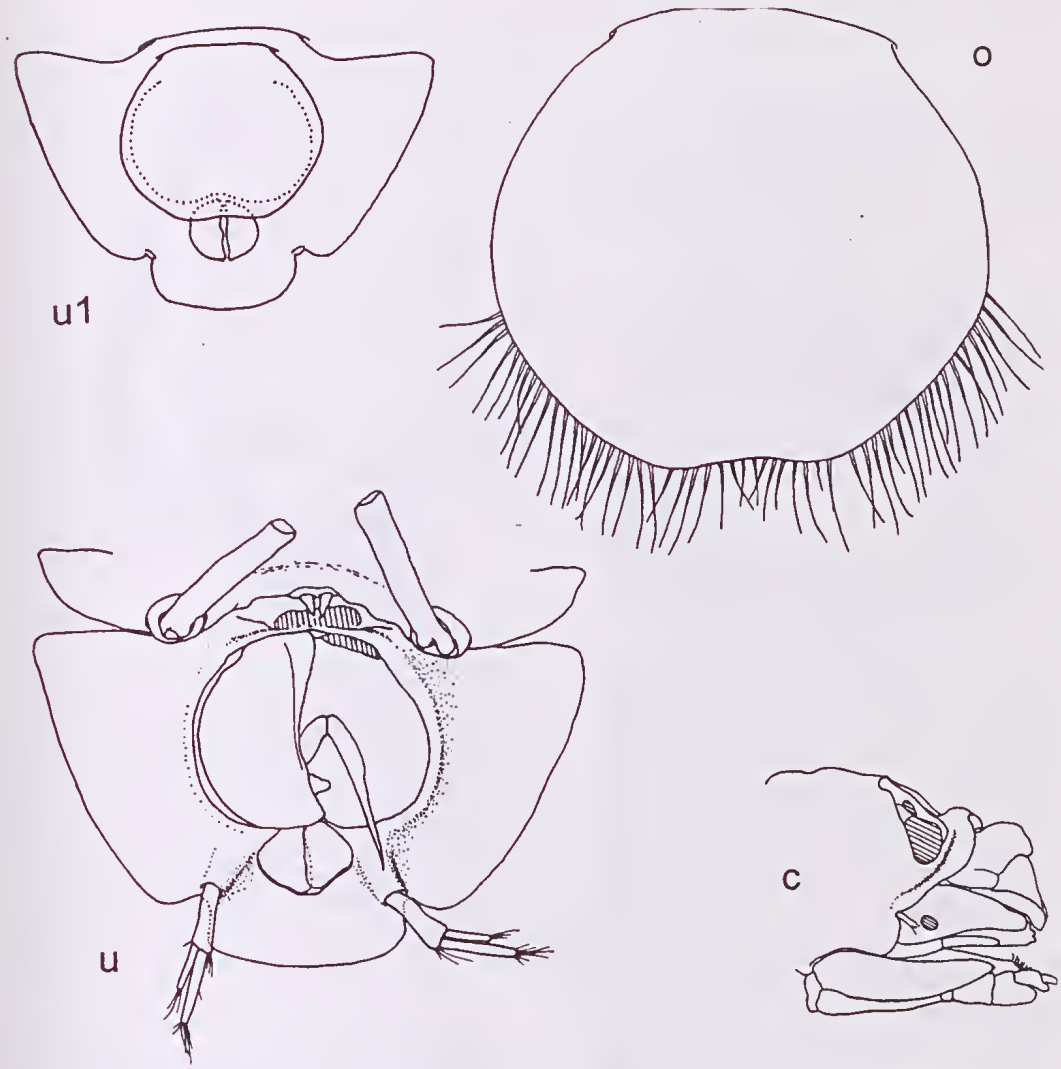

Figure 7. *Platyprotus phyllosoma* sp. nov. holotype. c, cephalon, right lateral view; u, urosome, ventral view. Paratype: u1, female urosome, ventral view; o, operculum enlarged.

of mandibular body by entire article 3, article 2 2.5 times longer than 1, with 2 tiny, curved, acute setae distolaterally, article 3 broad, of twisted spoon-shape, lateral and apical margins with highly modified spatulate setae, concave surface with densely set transverse rows of microsetules.

Lower lip outer lobes with medial row of robust setae and apical and lateral cover of setules, inner lobes rounded with lateral and apical setules.

Maxilla 1 outer lobe with 11 nearly straight spine-like setae, posterior 6 microdentate, inner lobe apically rounded, reaching to mediodistal corner of outer lobe, with 1 apical spine-like seta and many long setules. Maxilla 2 middle lobe slightly shorter than subequal outer and inner lobes, inner lobe 1.5 times width of equal width middle and outer lobes, outer and middle lobes with 2 long and 2 shorter smooth setae, inner lobe with apical row of short, pectinate setae and dense fringe of medial setules.

Maxilliped basis with 4 coupling hooks, truncate apex of endite with 6 slender fan setae, palp article 2 broadest distally, 1.5 times midwidth of endite, epipod reaching to distal end of palp

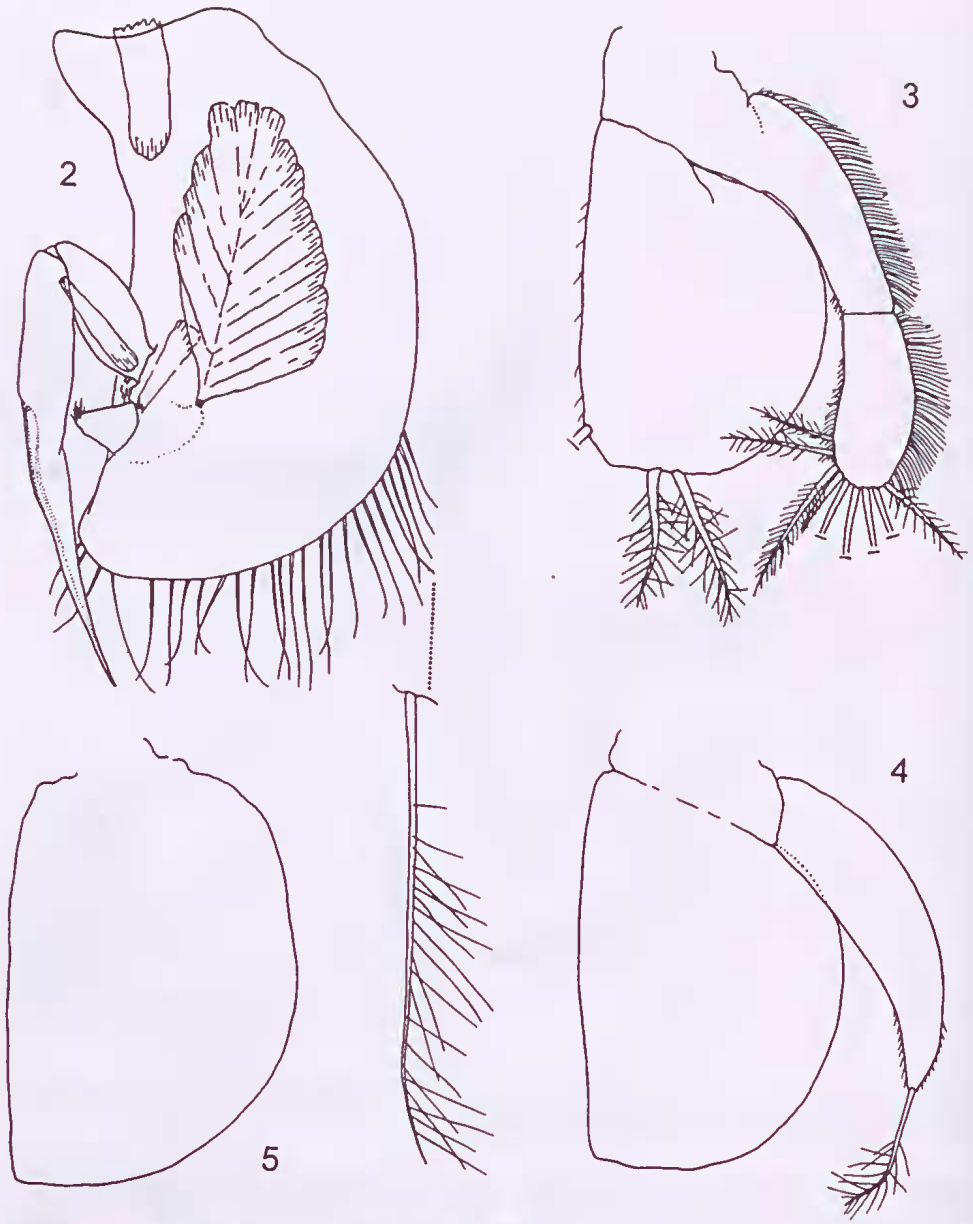

Figure 8. *Platyprotus phyllosoma* sp. nov., holotype. Pleopods 2–5 (2 viewed from above).

article 2, apex rounded, lateral margin smooth, convex in posterior half, slightly concave in distal half.

Pereopods: Pereopod 1 with scattered simple setae, much shorter and more slender than succeeding pereopods, about half length of cephalon and pereon combined; relative length of pereopods: 1 (1.0), 2 (not measured), 3 (1.9) 4 (2.5), 5 (1.7), 6 (1.7), 7 (broken); pereopods 2–3 carpus and propodus of equal length, carpus twice width of propodus, posterior margin of carpus and propodus with short simple setae and a few more robust setae; pereopod 4 propodus approximately third longer than carpus, carpus nearly 3 times

wider than propodus with 6 robust setae mainly in distal half, propodus with a few robust setae among small simple setae in distal half of posterior margin. Pereopods 5–7 fully ambulatory; propodus slightly shorter than carpus, carpus little wider than propodus; pereopods 5–6 (and presumably 7) carpus anterior margin with a few robust setae, propodus with row of 6–7 robust setae. Daetylar unguis of all pereopods with midpoint tooth on concave surface, pereopods 1–4 with 2 stiff setae arising from posterodistal corner of daetylus and resting against unguis tooth, pereopods 5–6 (presumably 7) with single strong, spatulate seta in same position.

Pleopods: (pleopod 1 not known); pleopod 2 protopod about half length of pleotelson, width of combined pleopods 2 about half midwidth of pleotelson, medial margin concave, lateral margin evenly convex, apex broadly rounded, distal part of lateral margin and apex with row of long, slender hemiplumose setae; exopod a short cone with setose apex; endopod inserted about 0.6 along protopod margin, stylet in retracted position overreaching protopod apex with about third stylet length. Pleopods 3–5 endopod of similar shape and size, broad, semirectangular, 3 with 3 apical pappose setae, 4 and 5 without setae, exopod of 3 as long as and third width of endopod, apex rounded with 9 long pappose setae, entire lateral margin of exopod with dense fringe of long setules; exopod of 4 reaching about two-thirds along endopod, tapering to pointed apex carrying 1 pappose seta; 5 without exopod.

Uropods 0.4 length of pleotelson, protopod and inner ramus of equal length, outer ramus 0.6 length of inner ramus, both rami with tuft of apical setae.

Female. Generally as male. Opereulum nearly circular with slightly concave apex, just covering respiratory chamber, fringed with long hemiplumose setae in distal half.

Etymology. The epithet is derived from the Greek *phyllos* = leaf and *soma* = body.

Acknowledgments

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